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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of SINGH et al.

Application No.: 10/081,979

Examiner: Marcheschi, Michael A.

Date Filed: February 22, 2002

Group: 1755

For: CHEMICAL-MECHANICAL POLISHING SLURRY  
FOR POLISHING OF COPPER OR SILVER FILMS

CERTIFICATE UNDER 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 14, 2004.

Neil R. Jetter

Reg. No. 46,803

DECLARATION UNDER 37 C.F.R. §1.131

Mail Stop RCE  
Commissioner for Patents  
P.O. box 1450  
Alexandria, VA 22313-1450

Sir:

I, Rajiv K. Singh, declare:

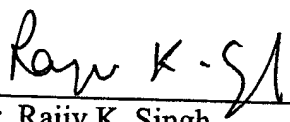
1. I am a named inventor of the subject matter claimed in the above-captioned application.
2. I have read the Office Action mailed February 13, 2004.
3. I have been employed by University of Florida since before March 2001.

4. I was one of the inventors which conceived of the above-entitled invention in the United States prior to the earliest effective filing date of January 17, 2002 that I have been advised may be afforded to U.S. Pat. No. 6,656,369 to Krishnan.

5. Before January 17, 2002, I, along with my co-inventor, Seung-Mahn Lee conceived of the claimed subject matter. Pages from my laboratory notebook dated March 25, 2001 which clearly describe the claimed invention are attached hereto and marked as Exhibit "A".

Declarant further states that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 6/14/04

  
\_\_\_\_\_  
Dr. Rajiv K. Singh

## PROPRIETARY

## NOTEBOOK CONTROL INFORMATION

COMPANY NAME University of Florida

SECTION \_\_\_\_\_

CONTROL (NOTEBOOK) NUMBER 1

ASSIGNED TO Raju Srivastava

SIGNATURE Raju S

ISSUE DATE March 20 '01 LAST ENTRY \_\_\_\_\_

OLD CONTROL NUMBER not given

NEXT CONTROL NUMBER \_\_\_\_\_

ASSIGNED BY Raju S

TOTAL PAGES DATA ENTERED \_\_\_\_\_

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| 4    | STI CMP                 | Mar 23/01   |
| 5    | Dmg Del. vng            | April 1, 01 |
| 6    | Dmg Del. vng            | April 5/01  |
| 7    | "                       | April 5/01  |
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PROJECT NAME CMP of CopperNOTEBOOK NO. 1

We discussed with Seuh Mahdee on further developments on copper CMP polishing

Experiment with no abrasive in the slurry.

Type of experiments to be completed

Slurry I (Low Removal Rate (LRR) slurry consisting of  $10^{-2}N I_2$  and  $10^{-3}KI$  +  $10^{-2}M$  TTA (5-methyl benzothiazole). This slurry leads to low removal but high degree of planarization. More testing is being performed by Seuh Mahn.

Slurry II (High Removal Rate (HRR) consisting of  $10^{-2}N I_2$  +  $10^{-3}KI$  +  $10^{-3} TTA$  which gives higher removal rate for copper

Following experiments are being conducted to both slurries

- ① Polishing on patterned and blank copper wafers for different times (30 sec 1 min and 2 min).

This will confirm how good the slurry will perform. The slurry is actually a solution without any particulate material.

In the future we plan to add some soft particles such as polymeric particles so that we can remove copper residuals on wafers which are not perfectly flat.

In all these polishing a surface film is formed which needs to be removed.

These experiments are being done to reconfirm the efficacy of the slurry.

continued →

SIGNATURE

READ AND UNDERSTOOD

*[Signature]*  
Seuh Mahn

DATE

Mar 25 20 01

DATE

Mar 25 20 01